CLAIMS

1. An oxide material of the following general formula:

$$A_{2-x-y}A'_xA''_yM_{1-z}M'_zO_{4+\delta} \quad (1)$$

where:

A is a metal cation belonging to the group formed by lanthanides and/or alkali metals and/or alkaline-earth metals;

A' is at least one metal cation belonging to the group formed by lanthanides and/or alkali metals and/or alkaline-earth metals;

A'' is a cationic vacancy, that is to say a cation A and/or cation A' vacancy;

M is a metal belonging to the group formed by metals of the transition elements; and

M' is at least one metal belonging to the group formed by metals of the transition elements,

said material being such that:

$0 < y < 0.30$, preferably $0 < y \leq 0.20$;

$0 < \delta < 0.25$, preferably $0 < \delta < 0.10$;

$0 \leq x \leq 1$; and

$0 \leq z \leq 1$.

2. The oxide material as claimed one of the preceding claims, such that:

A and A' are independently chosen from the group formed by lanthanum La, praseodymium Pr, strontium Sr, calcium Ca and neodymium Nd, preferably neodymium Nd, strontium Sr and calcium Ca and even more preferably neodymium Nd, and such that:

M and M' are independently chosen from the group formed by chromium Cr, manganese Mn, iron Fe, cobalt Co, nickel Ni and copper Cu, preferably nickel Ni and copper Cu, and even more preferably nickel Ni.

3. The oxide material as claimed in one of the preceding claims, such that:

A is chosen from the group formed by lanthanum La, praseodymium Pr and neodymium Nd, preferably neodymium Nd; and

A' is chosen from the group formed by strontium Sr and calcium Ca, preferably calcium Ca,

and such that:

M is chosen from the group formed by chromium Cr, manganese Mn, iron Fe, cobalt Co, nickel Ni and copper Cu, preferably nickel Ni; and

M' is chosen from the group formed by manganese Mn, iron Fe, copper Cu and cobalt Co, preferably copper Cu and manganese Mn.

4. The material as claimed in one of the preceding claims, having a crystallographic structure of the K_2NiF_4 type.

5. The material as claimed in one of the preceding claims, having an oxygen surface exchange coefficient k of greater than 1×10^{-8} cm/s at 500°C and greater than 2×10^{-6} cm/s at 900°C in the case of oxygen.

6. The material as claimed in one of the preceding claims, having an electronic conductivity σ_e of at least 70 S/cm, preferably at least 80 S/cm and even more preferably greater than 90 S/cm at 700°C.

7. The material as claimed in one of the preceding claims, having an oxygen diffusion coefficient of greater than 1×10^{-9} cm^2/s at 500°C and greater than 1×10^{-7} cm^2/s at 900°C.

8. An electrode comprising at least one material as defined in one of the preceding claims.

9. Device for producing electrical energy, of the fuel cell type comprising at least one electrochemical cell comprising a solid electrolyte, an anode, and a

cathode which is an electrode as defined in the preceding claim.

10. The use of an electrode as defined in claim 8 as an oxygen pump electrode for gas purification.